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# Electronic Medical Records for Burn Centers: What Do Users Need?

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In its influential 2001 report, *Crossing the Quality Chasm*, the U.S. Institute of Medicine (IOM) proposed: "IT [information technology] must play a central role in the redesign of the health care system if a substantial improvement in health care quality is to be achieved in the coming decade."<sup>1</sup> The U.S. government then launched a campaign (as part of the American Recovery and Reinvestment Act of 2009), Health Information Technology for Economic and Clinical Health, to support implementation and meaningful use of electronic health records (EHRs).<sup>2</sup> That campaign is now underway.

Are we headed in the right direction? On April 27, 2012, several users participated in a Luncheon Symposium at the American Burn Association annual meeting in Seattle. The purpose of the symposium was to discuss the use of the EHR in burn centers. What ensued was a thorough discussion of the advantages and disadvantages of the current generation of EHRs, and of the desirable features of the next generation. We would like to summarize our impressions from that meeting.

*The patient should come first.* It was generally acknowledged that EHRs were developed mainly in response to financial forces within the hospital, eg, to improve coding and billing, rather than in response to direct patient-care needs.<sup>3</sup> Effort now needs to be

expended to enhance the impact of the EHR on the quality of care. However, the high cost of developing an EHR is a barrier to improvement. Furthermore, some participants have encountered a significant requirement for "programming time" after the EHR is implemented to fashion a working system.

*The EHR should help the healthcare professional (HCP):* Similarly, it was generally felt that EHRs were not originally intended to help HCPs to do their jobs more efficiently, but that this should be a major factor in designing the next generation of EHRs. One participant observed that private physicians at his hospital refuse to use it, stating that the EHR is inefficient ("a waste of time").<sup>4</sup> Others highlighted an alternative approach: first, the importance of an involved and committed physician as the chief of the Information Management Office at his university hospital; second, the involvement of bedside registered nurses in IT administration.

*Data metastasis:* According to the experience of many nurses, EHRs cause an increased amount of time spent typing. Nurses and residents appear to have been pulled away from the bedside and to the keyboard. To some extent, this increased time spent documenting comes not from the EHR, but from other factors (such as a laudable effort to increase compliance with evidence-based practice). But the advent of the "paperless office" appears to have increased the amount of both digital and printed material involved in patient care. It is difficult to navigate the EHR to identify events of significance ("what really was done"). One participant wondered what a provider is legally required to review in an EHR that may accumulate many pages of digital content per patient per day. Such data metastasis does not prevent HCPs from making mistakes, such as the logging of incorrect vital signs imported from monitors in semiautomated fashion.

*Images:* Burn centers have a specific EHR needs. The first step in meeting these requirements is to recognize and document them. Requirements include a way to incorporate the burn wound diagram (eg,

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*L.C.C. and J.S. are coinventors of Burn Resuscitation Decision Support System, a software program. They have assigned their rights to this invention to the U.S. Army.*

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Lund–Browder chart) and digital photographs into the EHR. One burn center has stand-alone software developed for burn-size determination, and this program can feed into the EHR. Participants would like to set up a “clearinghouse” or other method of sharing such burn-specific software, so that each center does not have to develop its own programs. A problem with images is that the large file sizes may cause systems to crash, indicating that burn centers must be provided with hardware solutions intended for image management.

**Portals.** One hospital uses three different EHRs for inpatient and outpatient care, and an HCP from that hospital described sifting through different data sources in search of useful information. Participants described communication problems between inpatient and outpatient EHRs. A proliferation of different programs within the hospital environment means that HCPs must manage multiple usernames and passwords on multiple devices. A preferred alternative is a single device with one portal, one username, and one password, which gains access to all the main data sources.

**Custom displays.** Data displays in the EHR cannot be customized with ease. This stands in contrast to a paper flow sheet in which only those vital signs and laboratory values appropriate for a given patient on a given day can be chosen for display, and on which 24 hours’ worth of data can easily be displayed at once. Displays should be customizable for a specific HCP’s role. A nurse may need a different data set than a surgeon or a respiratory therapist, and these role differences should be respected. One advantage of the EHR is legible notes. Again and again, however, participants stated that the EHR does not facilitate the identification and communication of essential elements of information. This was described as a problem with “emphasizing the important stuff.” Ways to solve this problem include “reporting structures” and “power notes.”

**Mobility.** Many burn centers now report using computers on wheels during multidisciplinary team rounds, and find them increasingly useful. Because of the central role of the EHR in burn care, it is not surprising that there may be competition over the computers on wheels if there is only one available. Battery time and wireless connectivity are current major problems with the use of these portable devices.

Concerns such as those expressed above are not unique to the burn community. In a follow-up report this year, the IOM addressed safety issues associated with the current generation of EHRs. Furthermore, in a dissenting view, a member of the IOM committee stated that EHRs should be regulated as high-risk (class III) medical devices by the Food and Drug

Administration.<sup>5</sup> Others have argued that, at least, “this clinical intervention requires an evidence-based assessment similar to that to which other clinical innovations are subject.”<sup>6</sup> Specifically, computerized physician order entry may facilitate certain types of medical errors.<sup>7</sup> Introduction of an EHR impeded communication among team members on rounds.<sup>8</sup> Although EHRs are widely believed to improve the quality of care, the number of studies demonstrating such advantages is small.<sup>9,10</sup> One of the barriers to better health IT is lack of market incentives: end users do not buy the software.<sup>3</sup>

In conclusion, the EHR significantly changes patient-care processes in ways that are not fully understood. Burn HCPs have, to date, rarely been the drivers of these changes. We would like to encourage:

- Research on the impact of the EHR on provider efficiency and patient-care processes in burn centers;
- Documentation of burn-center-specific EHR requirements;
- Development of software for the specific needs of burn centers.

To this end, we welcome the work being done by the American Burn Association’s Technology and Organization and Delivery of Burn Care Committees.

## REFERENCES

1. Committee on Quality Health Care in America, Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy Press; 2001.
2. Blumenthal D. Launching HITECH. *N Engl J Med* 2010;362:382–5.
3. Mandl KD, Kohane IS. Escaping the EHR trap—the future of health IT. *N Engl J Med* 2012;366:2240–2.
4. O’Malley AS. Tapping the unmet potential of health information technology. *N Engl J Med* 2011;364:1090–1.
5. Committee on Patient Safety and Health Information Technology, Institute of Medicine. Health IT and patient safety: building safer systems for better care. Washington, DC: National Academies Press; 2012.
6. Lapinsky SE. Clinical information systems in the intensive care unit: primum non nocere. *Crit Care* 2009;13.
7. Koppel R, Metlay JP, Cohen A, et al. Role of computerized physician order entry systems in facilitating medication errors. *JAMA* 2005;293:1197–203.
8. Morrison C, Jones M, Blackwell A, Vuylsteke A. Electronic patient record use during ward rounds: a qualitative study of interaction between medical staff. *Crit Care* 2008;12:R148.
9. Cebul RD, Love TE, Jain AK, Hebert CJ. Electronic health records and quality of diabetes care. *N Engl J Med* 2011;365:825–33.
10. Schiff GD, Bates DW. Can electronic clinical documentation help prevent diagnostic errors? *N Engl J Med* 2010;362:1066–9.